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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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David K. Biegelsen

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ALEXANDRIA, VA 22320-4850

EXAMINER

OLANIRAN, FATIMAT O

ART UNIT

PAPER NUMBER

4178

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/800,848	Applicant(s) BIEGELSEN, DAVID K.	
	Examiner Fatimat O. Olaniran	Art Unit 4178	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>All</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 6-8 are objected to because of the following informalities:

Claim 6, line 1 "the coordinate system" lacks antecedent.

Claim 7, line 2 "the plurality of hypersonic wavelets" lacks antecedent basis.

Claim 7, line 3 "the hypersonic beams" lacks antecedent basis.

Claim 7, line 5 "the objects detected" lacks antecedent basis.

Claim 8, line 3 "the parameters" lacks antecedent basis.

This list is not exhaustive, applicant must ensure that all claim limitations have antecedent basis that correspond to the claim's dependency.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1 and 10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1, claims "a method for processing hypersonic signals, comprising: generating a signal; and forming a plurality of wavelets of the signal at a plurality of phases".

However, it is not statutory because it does not fall in to any of the statutory categories of invention as recited in section 101 of this article. Claim 1 is directed towards a signal

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per se that as claimed does not result in a physical transformation or produce a useful, concrete and tangible result. See MPEP 2106 section IV.

Claim 10, claims "a computer readable medium or a modulated signal being encoded to perform the method of claim 1". However, it is not statutory because it does not fall in to any of the statutory categories of invention as recited in section 101 of this article. Claim 10 is directed towards a signal per se that as claimed does not result in a physical transformation or produce a useful, concrete and tangible result. See MPEP 2106 section IV.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-7 and 9-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Manabe (6556687).

Claim 1 Manabe discloses a method for processing hypersonic signals (col. 6 line 39-41), comprising: generating a signal (col. 6 line 53); and forming a plurality of wavelets of the signal at a plurality of phases (col. 6 line 61-62).

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Claim 2 Manabe discloses forming one or more focused hypersonic beams based on the wavelets (col. 7 line 22-24); receiving one or more reflected hypersonic signals (col. 9 line 27-30); and detecting objects based on the reflected hypersonic signals (col. 9 line 43-44).

Claim 3 Manabe discloses synthesizing one or more hypersonic ping signals (col. 4 line 47-49); and emitting the hypersonic ping signals as the focused hypersonic beams (col. 4 line 50-51).

Claim 4 Manabe discloses encoding the hypersonic ping signals using one or more frequencies (col. 9 line 30-33); and directing each of the focused hypersonic beams in different directions (col. 10 line 6-8), each of the focused hypersonic beams corresponding to one of the hypersonic ping signals (col. 9 line 3-5).

Claim 5 Manabe discloses setting a coordinate system for a space; scanning the space based on the coordinate system; and recording object parameters corresponding to detected objects (col. 9 line 10-12, line 43-44)

Claim 6 Manabe discloses the coordinate system is suitable for one, two or three dimensional space (col. 9 line 43-44).

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Claim 7 Manabe discloses generating the plurality of hypersonic wavelets (col. 4 line 47-51) based on a set of parameters that specify one or more neighborhoods for the hypersonic beams (col. 9 line 3-4); and transmitting audio information based on the parameters to one or more of the objects detected at locations corresponding to the neighborhoods (col. 10 line 48-51).

Claim 9 Manabe discloses receiving environment information; and setting the parameters based on the environment information (col. 9 line 39-41).

Claim 10 Manabe discloses a computer readable medium or a modulated signal being encoded to perform the method of claim 1 (col. 6 line 58-60 and col. 7 line 17-18).

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 11-13, 15-16 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Savord et al (5997479).

Claim 11 Savord discloses an apparatus that processes hypersonic signals (col. 2 line 64), comprising: a memory (col. 4 line 27); a plurality of transducer elements formed into a transducer element array (col. 2 line 65-

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66); a driver that drives the transducer elements with a signal at a plurality of phases (col. 3 line 34-36).

Claim 12 Savord discloses a delay processor (col. 15 line 8-10) that forms the phases of the signal causing the transducer element array to form a focused hypersonic beam (col. 14 line 40-42); and
a detector that detects objects based on echo signals received by the transducer element array (col. 12 line 44-45 line 54-56).

Claim 13, Savord discloses disclose a frequency selector (col. 1 line 30-33, frequency selector: transducers) that selects one or more frequencies based on transmission parameters (col. 1 line 39-41 parameters: delays), a delay processor that determines a plurality of delays corresponding to the hypersonic transducer elements that is required to form a focused hypersonic beam directed at a specified direction (col. 6 line 52-55); and a signal generator that generates a signal that includes selected frequencies, the signal being delayed by a corresponding one of the plurality of delays before driving each of the hypersonic transducer elements through the driver (col. 6 line 56-59).

Claim 15 Savord disclose a controller that sets a coordinate system for a space (col. 15 line 51-53), scans the space by directing the focused hypersonic beam to proceed based on the coordinate system and records coordinates of detected objects based on echoes from the focused hypersonic beam (col. 15 line 56-60 and col. 14 line 46-49).

Claim 16 Savord discloses a signal generator that generates an output signal corresponding to each of the hypersonic transducer elements based on parameters stored in the memory (col. 3 line 5-8), the controller specifying a neighborhood for the focused hypersonic beam based on one or more object locations and controlling the signal generator to generate the output signal to encode audio information for transmission to the neighborhood (col. 3 line 10-13 and line 34-36).

Claim 23 Savord discloses a method for processing hypersonic signals, comprising: receiving a hypersonic signal; and delaying the hypersonic signal by a plurality of phases to select portions of information in the hypersonic signal (col. 3 line 20-31).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Manabe (6556687) in view of Savord et al (5997479).

Claim 8 Manabe discloses selecting one or more carrier hypersonic frequencies based on the parameters (col. 6 line 53-54, col. 9 line 4-5); generating one or more side bands, one side band corresponding to each of the carrier hypersonic frequencies, the side bands being encoded with audio information (col. 6 line 58-60);

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generating a plurality of output signals, each of the output signals corresponding to one of the side bands;(col. 10 line 48-52).

Manabe does not disclose generating a plurality of sets of phase shifts; generating a plurality of driving signals, each of the driving signals being a combination of the plurality of output signals, wherein each of the output signals is phase shifted by an appropriate phase shift of the set of phase shifts for that output signal; and driving each of the hypersonic wavelets with one of the driving signals.

Savord discloses generating a plurality of sets of phase shifts (col. 3 line 18-20); generating a plurality of driving signals, each of the driving signals being a combination of the plurality of output signals, wherein each of the output signals is phase shifted by an appropriate phase shift of the set of phase shifts for that output signal; and driving each of the hypersonic wavelets with one of the driving signals (col. 3 line 24-31). Therefore it would be obvious to one ordinarily skilled in the art at the time the invention was made to modify the super-directional loudspeaker of Manabe with the delay processor and synthesizer of Savord in order to produce three-dimensional images using ultra-sound.

9. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Savord et al (5997479).

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Claim 14 analyzed with respect to claim 13, 12 and 11, Savord discloses the frequencies being selected to form a code to enhance reception of echoes of the focused hypersonic beam from the objects (col. 6 line 56-59).

Savord does not disclose the frequency selector selecting the frequencies based on a noise environment.

Official Notice is taken that it is well known in the art that the frequency selection of an audio signal is changed according to the noise ambience. Therefore it would have been obvious to one of ordinary skill in the art to modify Savord to have a frequency selector based on the noise environment so as to maintain the audio level output according to the noise.

10. Claims 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savord et al (5997479) in view of Manabe (6556687).

Claim 17 analyzed with respect to claim 16, 15, 12 and 11, Savord discloses the delay processor generating a set of driving signals, each of the driving signals being the output signal delayed by one of a set of delays corresponding to phase shifts for each of the transducer elements to form the focused hypersonic beam col. 3 line 34-37); and the driver driving one of the driving signals to each of the transducer elements to form the focused hypersonic beam (col. 3 line 10-13).

Savord does not disclose the signal generator generating the output signal to include a side band for encoding the audio information.

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Manabe discloses the signal generator generating the output signal to include a side band for encoding the audio information (col. 4 line 58-60). Therefore it would be obvious to one ordinarily skilled in the art to modify the audio signal of Savord with the amplitude modulation means of Manabe in order to transmit audio information to an object.

Claim 18 analyzed with respect to claim 17, 16, 15, 12 and 11, Savord discloses the signal generator generating a plurality of output signals and the delay processor generating a plurality of sets of delays (col. 11-12 and line 36), the delay processor delaying each of the output signals by a corresponding set of delays for one of the plurality of audio information (col. 3 line 36), the delay processor combining all delayed output signals for each of the transducer elements and outputs combined output signal to the driver for driving each of the transducer elements (col. 5 line 46-52). Savord does not disclose wherein the controller selects one or more carrier frequencies for transmission of a corresponding plurality of audio information.

Manabe discloses wherein the controller selects one or more carrier frequencies for transmission of a corresponding plurality of audio information (col. 6 line 53-56).

Therefore it would be obvious to one ordinarily skilled in the art to modify the controller of Savord with the amplitude modulation means of Manabe in order to transmit audio information to an object.

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Claim 19 analyzed with respect to claim 18, 17, 16, 15, 12 and 11, Savord in view of Manabe further disclose the hypersonic transducer transmitting a plurality of focused hypersonic beams each of the focused hypersonic beams delivering one of the plurality of audio information to a unique neighborhood (Manabe col. 10 line 37-38 and line 49-52) as based on the delays (Manabe col. 9 line 39-41)

Claim 20, analyzed with respect to claim 18, 17, 16, 15, 12 and 11, Savord in view of Manabe further disclose the controller receiving environment information, and selecting carrier frequencies and amplitude of the output signals based on the environment information (Manabe col. 10 line 37-38 and line 49-52).

Claim 21 Savord discloses an apparatus for detecting one or more objects, comprising means for scanning a space using a focused hypersonic beam (col. 15 line 56-60);

Savord does not discloses means for detecting the objects based on echo signals of the focused hypersonic beam; and means for delivering audio information to a neighborhood of detected objects.

Manabe discloses means for detecting the objects based on echo signals of the focused hypersonic beam (col.9 line 27-31); and means for delivering audio information to a neighborhood of detected objects (col. 9 line 10-13). Therefore it would be obvious to one ordinarily skilled in the art to modify the audio signal of Savord with the amplitude modulation means of Manabe in order to transmit audio information to an object.

Claim 22 analyzed with respect to claim 21 Savord discloses means for scanning the space using multiple focused hypersonic beams (col. 15 line 56-60); Savord does not discloses means for delivering unique audio information to different neighborhoods using multiple hypersonic beams. Manabe discloses means for delivering unique audio information to different neighborhoods using multiple hypersonic beams (col. 10 line 48-52).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fatimat O. Olaniran whose telephone number is 571-270-3437. The examiner can normally be reached on M-F Alt F off 8:30-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hai Tran can be reached on 571-272-7305. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FO



**HAI TRAN
PRIMARY EXAMINER**